REMARKS/ARGUMENTS

Claims 1-25 remain in this application. Claims 1, 5, 9, 11 and 13-15 have been amended. Claims 20-23 have been withdrawn as a result of an earlier restriction requirement. In view of the examiner's earlier restriction requirement, applicant retains the right to present claims 20-23 in a divisional application.

Claims 1-19, 24, 25 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "close proximity" in claim 1 was unclear to the Examiner.

Accordingly, claim 1 has been amended to make it more definite, it now calls for "component situated adjacent to said electrolyte". This feature is illustrated, for example, in Fig.1 of the specification. Claims 2-19, 24 and 25 depend from claim 1 as their dependent claims and, therefore, explicitly incorporate the language of claim 1. Thus, claims 1-19, 24 and 25 are no longer indefinite.

Claims 1, 5, 7-9, 11, 13-19, 24 and 25 are rejected under 35 USC 102(e) as being anticipated by Badding (US Publication 2003/0096147) as evidence by Pham et al (US Publication 2002/0127460 A1).

Claim 1 has been amended to specify that protective coating is less than 100 μm thick. Claims 7-8, 24 and 25 depend from claim 1 as their dependent claims and, therefore, explicitly incorporate the language of claim 1. Accordingly, claims 7-8, 24 and 25 are not anticipated by Badding.

Claim 5 is an independent claim. It specifies that the "protective coating is selected from a group consisting of glass, zirconia and ytria-stabilised zirconia, oxides of magnesium, titanium

and zinc". This feature is also not disclosed in Paragraph 43 of the Badding reference (US Publication 2003/0096147).

Claim 9 is an independent claim. It calls for the "metal frame supporting said electrolyte without being in electrical contact with any electrodes". In addition, it specifies that the protective coating is less than 100 μm thick. Claims 11, 13-19 depend from claim 9 as their base claim. Thus, claims 11, 13-19 are not anticipated by Badding (US Publication 2003/0096147).

Claims 1-18, 24 are rejected under 35 USC 103(a) as being unpatentable by Quadakkers et al (US Patent 5,733,682) as evidence by Pham et al (US Publication 2002/0127460).

Applicants' claims (see for example claim 1) call for solid oxide fuel cell device comprising a non-electrically active component situated adjacent to the electrolyte, and a protective coating situated on at least one surface of said component. The "protective coating substantially prevents said at least one metal or the oxide of said metal from leaving said surface, said coating also being substantially impermeable to oxygen".

1. The Examiner, in referring to the Quadakkers reference pointed out that "At prefabricate steps of forming the aluminum oxide layer on the bipolar plate the protective layer covers all of the bipolar plate which causes the entire region to be non-conductive". However, this is before the device is assembled together-i.e., before there is a device. A functional bipolar plate is conductive by definition-being conductive is its required function. If the bipolar plate is not electrically conductive, the fuel cell device will not work. In fact, this reference itself (col. 1, lns. 42-50) states that "the bipolar plate must therefore have the following properties... 5. Good electrical conductivity".

2. The Examiner, in referring to the Pham reference pointed out that "Pham et al. discloses that the interconnect surface conduction is enhanced by chromium oxide layer, however at

temperatures lower than 800 °C it proves to be ineffective (Paragraph 14-15). Therefore these bipolar plates are non-electrically conductive and are not in contact with electrodes because of the coated layers on the bipolar plate."

Paragraph [0005] of the Pham reference that alumina coatings are poorly conductive, "making the ally unsuitable for use as fuel cell interconnect". I.e., paragraph [0005] of this reference teaches not to use alumina coatings on electrically conductive components (such as bipolar plates, for example) because they interfere with the function of these components. That is, this reference actually teaches away from this aspect of Applicants' invention. The Quadakkers reference overcame this problem by stripping the aluminum coatings from the areas of the bipolar plate that contacts electrodes, thus preserving its function of electrical conductivity. However, as discussed in paragraph [0005] of the Pham reference, the "unprotected areas" (i.e., areas without the alumina coating) have a problem because "At high temperatures, chromia vaporization can caused poisoning of the fuel cell electrodes and thus performance degradation." Applicants solved this problem by not using bipolar plates, and more specifically, by having a non-electrically active component (e.g. frame). If this component does not have to be electrically active, coating it with aluminum coatings will not interfere with its function.

Paragraph [0006] of the Pham reference states that the prior art tried, but failed to solve the above described problem with (La, Sr)CrO_3 coating and/or the same material as the fuel cell electrode, because this coating has low conductivity at temperatures below 800 °C, and thus "are inadequate for fuel cells operating at temperatures lower than 800 °C." That is, the Pham reference teaches that (La, Sr)CrO_3 coatings can not be used for fuel cells operating at temperatures lower than 800 °C, because they interfere with the function of the fuel cell device- i.e., they should not be used on electrically conductive components such as bipolar plates. That is, Pham would teach one of ordinary skill in the art not to use such coatings on bipolar plates.

Contrary to the Examiner's assertion, the Pham reference does not suggest that the bipolar plates should be nonconductive, or that they are non conductive. A fuel cell with a

nonconductive bipolar plate does not function. Instead the Pham reference teaches that these coatings should not be applied to the electrically conductive components, and thus are inadequate for fuel cells operating at temperatures lower than 800 °C. Accordingly, Pham's solution is to make protective coatings on fuel cell interconnects (e.g., bipolar plates) of gold, platinum, palladium, rhodium or silver (see paragraphs [0015] and [0016] of Pham reference).

Applicants offered a different solution. They do not use a bipolar plate. They use a "non-electrically active component", such as a non-electrically active frame. Accordingly, a non-conductive protective coating can not interfere with the function of this component. This non-conductive component is not an electrical interconnect, such as electrical bipolar plate is.

3. With regard to claims 7, and 13-15, these claims teach that a non-electrically active component has a protective coating, and the protective coating is a non-electrically conductive coating. The Quaker reference does not disclose a device with a non-electricall y active component. The bipolar plate in the Quaker's finished device is electrically active.

4. The Examiner also pointed out that Quaker teaches that voltage can be obtained from a single cell. However,Quaker does not teach the use of bipolar plates with a single cell. Quaker teaches that when more than one cell is required these cells must be electrically interconnected. "For this purpose a further component is required, namely bipolar plate or interconnector" and that the bipolar plate must be electrically conductive. (see col. 1, lns 32-50). The Examiner than stated that if a single cell was to be used with a bipolar plate, "this would prevent the bipolar plate to be an electrical connector and would only function as a frame". However, as stated above, there is no teaching in the Quaker reference of why one would use a bipolar with a single device. Furthermore, a single fuel cell device still need to be electrically connected (interconnected) to the outside world, in order to provide its power, as required, to something else. The function of bipolar plate is to be an electrical connector. Thus, assuming, arguendo, that one would use a bipolar plate with a single cell, one would probably use this bipolar plate to get the generated electrical power of the fuell cell to the

external world. The Quaker reference teaches no other way to get the electrical power off the fuel cells.

Finally, Claim 9 specifies "a metal frame supporting said electrolyte without being in electrical contact with any electrodes". The bipolar plate of the cited reference is in electrical contact with the electrodes.

Conclusion

Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension or for any independent claims in excess of 3 to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Svetlana Z. Short at 607-974-0412.

Respectfully submitted,

Svetlana Short

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Svetlana Z. Short
Attorney for Assignee
Registration Number: 34,432
Corning Incorporated
SP-TI-03-1
Corning, NY 14831
Phone: 607-974-0412